

ABSTRACT OF THE DISCLOSURE

A method for fabricating a bottle-shaped trench capacitor. A first conductive layer surrounded by a doped layer is filled in the lower portion of a trench in a substrate. A buried bottom plate is formed in the substrate near the doped layer by a heat treatment. A collar insulating layer is formed over the sidewall of the upper portion of the trench. The first conductive layer and the doped layer are removed using the collar insulating layer as a mask, and then a portion of the doping region is etched to form a bottle-shaped trench. A rugged polysilicon layer and a capacitor dielectric layer are conformably formed in the lower portion of the trench which is subsequently filled with a second conductive layer to serve as a top plate.